



Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 28: Weather Data Service

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Contents

Intellectual Property Rights	4
Foreword.....	4
Modal verbs terminology.....	4
1 Scope	5
2 References	5
2.1 Normative references	5
2.2 Informative references	5
3 Definition of terms, symbols and abbreviations.....	5
3.1 Terms.....	5
3.2 Symbols.....	5
3.3 Abbreviations	6
4 Data Service Definition	6
4.1 Weather Data Service Version 1.0	6
5 SBP Binding.....	8
6 Theory of Operations.....	8
6.1 Getting Weather updates	8
Annex A (informative): Authors and Contributors.....	10
History	11

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 28 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.1].

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The present document is part of the MirrorLink® specification which specifies an interface for enabling remote user interaction of a mobile device via another device. The present document is written having a vehicle head-unit to interact with the mobile device in mind, but it will similarly apply for other devices, which provide a colour display, audio input/output and user input mechanisms.

The present document specifies weather data service based on SBP (Service Binary Protocol) framework. The service is used to provide weather data in car environments.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 103 544-27 (V1.3.1): "Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 27: Basic Meta Data Service".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long-term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI TS 103 544-1 (V1.3.1): "Publicly Available Specification (PAS); Intelligent Transport Systems (ITS); MirrorLink®; Part 1: Connectivity".

3 Definition of terms, symbols and abbreviations

3.1 Terms

Void.

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

SBP	Service Binary Protocol
UV	Ultra Violet

4 Data Service Definition

4.1 Weather Data Service Version 1.0

```

/** The present document defines data objects for the weather data
 * service to be carried over by SBP. By receiving this data, the
 * weather data sink can provide weather information to the driver
 * through instrument cluster display panel. The Weather Source may
 * be implemented in a Mirrorlink Client or a Mirrorlink Server.
 * @version 1.0
 */
SERVICE com.mirrorlink.meta.weather
: com.mirrorlink.meta.basic version 1.0 {
/** The City object capture the city information for which weather
 * data is captured
 * @mandatory, @writable, @uid 0x18da0af0
 */
OBJECT City {
/** Geographic latitude in degree; a positive value indicates
 * north, a negative value south. Allowed values are -90 to 90.
 * @mandatory, @uid 0x64f8f3f1
 */
DOUBLE latitude;
/** Geographic longitude in degree; a positive value indicates
 * east, a negative value west. Allowed values are -180 to 180.
 * @mandatory, @uid 0x7581892a
 */
DOUBLE longitude;
/** Height of the position above the coordinate system's ellipsoid
 * in meter.
 * @mandatory, @uid 0x970e9047
 */
DOUBLE altitude;
/** name of the city where weather data was captured.
 * @optional, @writable, @uid 0xe9b422d0
 */
STRING city;
/** name of the country where weather data was captured.
 * @optional, @writable, @uid 0x554bca71
 */
STRING country;
/** zipcode of the place where weather data was captured.
 * @optional, @uid 0xb82fcc49
 */
STRING zipcode;
};
/** The temperature object captures the temperature information. When
 * this object is supported all the parameters shall be supported.
 * @optional, @uid 0xca0e732f
 */
OBJECT Temperature {
/** temperature in degrees
 * @mandatory, @uid 0x1ac4b311
 */
SHORT degree;
/** defines if temperature measured is in Celsius or not
 * @mandatory, @uid 0xfa52da6f
 */
BOOLEAN isCelsius;
/** Maximum temperature of the day
 * @mandatory, @uid 0x6ac64539
 */
SHORT maximumTemperature;
/** Minimum temperature of the day

```

```

    * @mandatory, @uid 0x5c159fcb
    */
    SHORT minimumTemperature;
};
/** The humidity object captures the humidity information in %
    * @optional, @uid 0xa85a2c78
    */
OBJECT Humidity {
    /** measured humidity value
        * @mandatory, @uid 0x0a906458
        */
    SHORT humidity;
};
/** The pressure object captures the pressure information in hPa
    * @optional, @uid 0xf40c8faa
    */
OBJECT Pressure {
    /** Air pressure value in hpa
        * @mandatory, @uid 0x5642c78a
        */
    SHORT pressure;
};
/** The wind object captures the wind information. When this object
    * is supported at least one of the parameters shall be supported.
    * @optional, @uid 0xbb5c584d
    */
OBJECT Wind {
    /** Wind speed in km per hour or miles per hour
        * @optional, @uid 0xda62001a
        */
    SHORT windSpeed;
    /** Wind speed type: 0 - km per hour; 1 - miles per hour
        * @optional, @uid 0x709511c7
        */
    BOOLEAN windType;
    /** Wind direction in degrees ranging from 0 - 360, with 0
        * pointing to North
        * @optional, @uid 0xbc406cf0
        */
    SHORT windsFrom;
};
/** The Rain object captures the rain information. When this object
    * is supported at least one of the parameters shall be supported.
    * @optional, @uid 0xcec4c759
    */
OBJECT Rain {
    /** Probability of rainfall with range 0 ~ 100
        * @optional, @uid 0xcb15db4c
        */
    SHORT rainfallProbability;
    /** If there is Rain (true) or Snow (false) expected
        * @optional, @uid 0x7c0cac89
        */
    BOOLEAN isRainorSnow;
    /** rainfall rate in inch or mm
        * @optional, @uid 0x8a055334
        */
    FLOAT rainfallRate;
    /** rainfall rate type: mm (false), Inch (true)
        * @optional, @uid 0x54178dce
        */
    BOOLEAN rainfallRateType;
};
/** The Misc_Weather object captures the misc. weather information
    * @optional, @uid 0x8cdb2d46
    */
OBJECT Misc_Weather {
    /** measured UV Index value ranging between 0~11
        * @optional, @uid 0x4af8e8cc
        */
    SHORT uvIndex;
    /** Percentage of cloud cover with range 0 ~ 100
        * @optional, @uid 0x9ab38d87
        */
    SHORT cloudCover;
};
/** The Alerts object captures the extreme weather alerts
    * @mandatory, @uid 0x912b62bc

```

```

*/
OBJECT Alerts {
  /** Extreme weather Level ranging from 1 ~ 5, with 5 being extreme
   * @mandatory, @uid 0x4ba58f8d
   */
  SHORT alertLevel;
  /** Descriptive text related to extreme weather
   * @optional, @uid 0xf9181f24
   */
  STRING alertText;
};
};

```

5 SBP Binding

The Weather Meta Data Services uses the following objects and their access capabilities, as defined in [1].

Table 1

Object Name	Access Type	Subscription Type	Min Interval Time	Max Interval Time
City	WRITABLE	NONE	N/A	N/A
Temperature	READABLE	ON_CHANGE	N/A	N/A
Humidity	READABLE	ON_CHANGE	N/A	N/A
Pressure	READABLE	ON_CHANGE	N/A	N/A
Wind	READABLE	ON_CHANGE	N/A	N/A
Rain	READABLE	ON_CHANGE	N/A	N/A
Misc_Weather	READABLE	ON_CHANGE	N/A	N/A
Alert	READABLE	ON_CHANGE	N/A	N/A

6 Theory of Operations

6.1 Getting Weather updates

Figure 1 shows how a weather data sink retrieves metadata about the current weather condition from the weather data source.

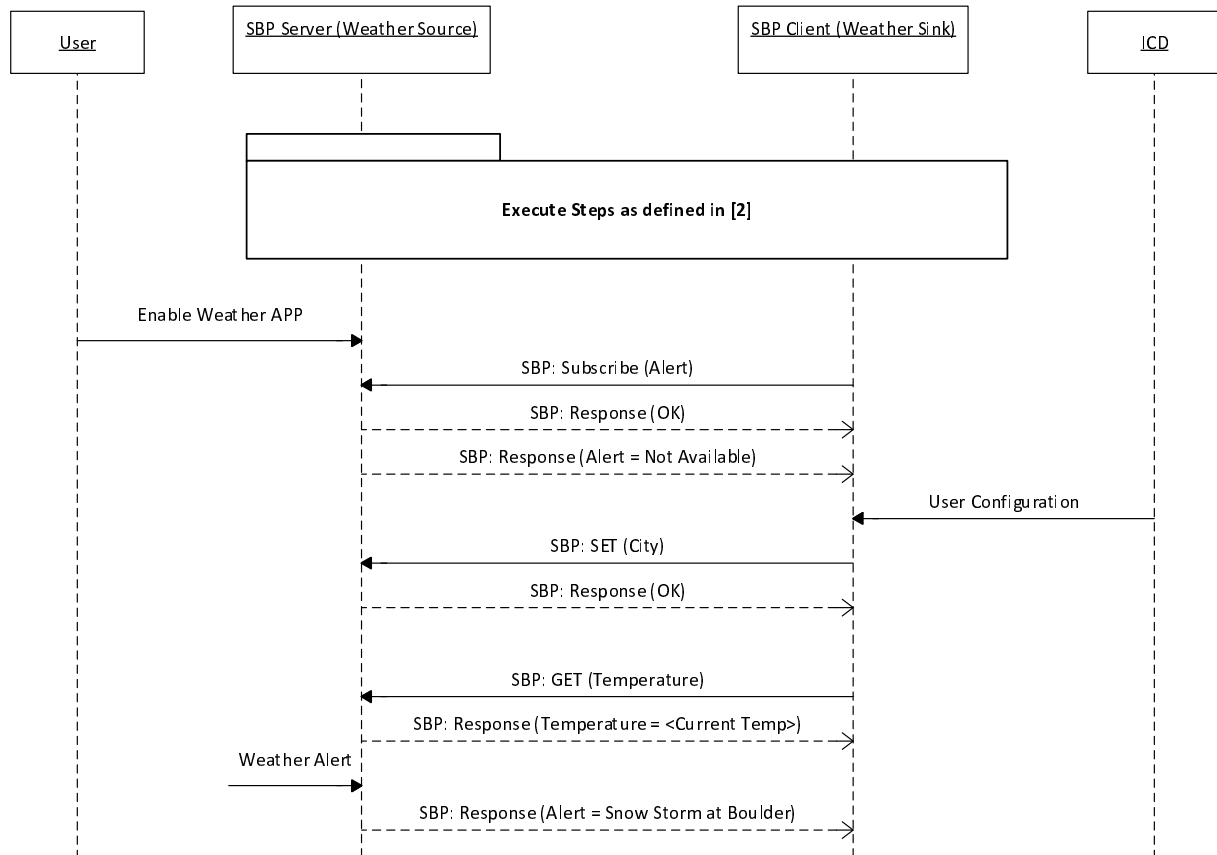


Figure 1: Message Sequence Diagram - Retrieve weather metadata

It consists of the following steps, after the data service has been setup as defined in [1]:

- 1) Weather Sink sends an SBP *Subscribe* message for the *Alert* object; Subscription is ON_CHANGE. The Weather Source responds first with an SBP *Response* message confirming the *Subscribe* message, followed by a second SBP *Response* message containing a "Not Available" error code, as no alert is currently available.

NOTE: In case an alert is already available, the Weather Sink will return a valid Alert object, representing the current Alert.

- 2) User wants to see weather at a particular city en-route. Weather Sink sends SBP *Set* message to the *City* object. The Weather Source responds with an SBP *Response* message confirming the setting.
- 3) Weather Sink sends SBP *Get* message to the *Temperature* object. The Weather Source responds with the SBP *Response* message, containing the Temperature object, representing the current temperature.
- 4) In the meanwhile, there is an alert for severe snow storm en-route. Weather Source sends an SBP *Response* message for the *Alert*, containing the Alert object, representing the current alert.

The Weather Sink can subscribe to all weather-related objects e.g. *Temperature*, *Humidity* etc., which will contain the current weather information. Any updates in the objects are sent on a regular basis to the Weather Sink.

Annex A (informative): Authors and Contributors

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